Remarks

The present amendment responds to the final Official Action dated January 10, 2005. The Official Action rejected claims 1 and 12 under 35 U.S.C. §112, second paragraph, as being indefinite. The Official Action rejected claims 1 and 12 under 35 U.S.C. § 103(a) as being unpatentable over Murray et al. U.S. Patent No. 6,622,142 (Murray) in view of Koeppen U.S. Patent No. 5,761,667 (Koeppen). Claims 2-5, 13-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Murray in view of Koeppen and further in view of Coy et al. U.S. Patent 5,644,766 (Coy). Claims 6, 8-11, 17, 19-22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Murray in view of Koeppen, in view of Coy, and further in view of Pastilha et al. U.S. Patent 5,678,044 (Pastilha). Claims 7 and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Murray in view of Koeppen, in view of Coy, and further in view of Donovan et al. U.S. Patent 6,012,032 (Donovan).

Claims 1 and 12 have been cancelled, claims 2, 4-8, 13, and 16-19 have been amended to be more clear and distinct, and claims 23-25 have been newly added. Claims 2-11 and 13-25 are presently pending.

Section §112, Second Paragraph Rejection

With the canceling of claims 1 and 12 the rejection is moot.

The Art Rejections

All of the art rejections hinge on the application of Murray or various combinations of Murray with Koeppen, Coy, Pastilha, or Donovan. As addressed in greater detail below, the relied upon art does not support the Official Action's reading of it and the rejections based thereupon should be reconsidered and withdrawn. Further, the Applicant does not acquiesce in the analysis of the relied upon art made by the Official Action and respectfully traverses the Official Action's analysis underlying its rejections.

As discussed in the Background of the present invention, the tools known to the inventor at the time of the invention were not able to reliably provide accurate capacity information for large databases during normal system operation. For large databases, such as databases that reach or exceed 8.4 billion bytes, the inventor found that existing tools either failed or provided unreliable results. It was further determined that for databases that span multiple disk storage volumes, existing tools would provide unreliable results. Specification, page 1, lines 17-24, page 3, lines 18-21, and page 5, line 16 – page 6, line 21. Murray does not describe any problem associated with using existing tools for space determination of a database that spans multiple disk storage volumes. Rather, Murray's system is a reorganization system requiring the "unloading and reorganization of hierarchical databases". Murray, col. 4, lines 15-17. As a reorganization system, Murray's system does not operate during the storing of data files and transaction data in a database because "When a database is reorganized, the area being reorganized becomes unavailable and therefore, the data resident in the area under reorganization becomes unavailable." Murray, col. 4, lines 3-5. Consequently, Murray does not recognize and

does not address problems with existing tools for space determination that operate during the storing of data files in a database as presently claimed.

There is a significant distinction between monitoring a database and the processing required for database reorganization. It is important to note this distinction because the present invention is a monitoring process operative during the storing of data files in a database while Murray and Koeppen both describe reorganization operations requiring the rearrangement of data files in a database.

The present invention describes a transaction processing system and events regarding space determination. Fig. 1 shows an IMS OSAM free space monitor system 100 that "...includes a source of online transaction data 110, a mainframe computer 120, three disk storage memories, volumes, or disks 1, 2, and 3 130, 140, and 150, ..." Specification page 4, lines 18-23. "In operation, data is provided to mainframe computer 120 from a data source or sources, such as the source of online transaction data 110. ... the present invention provides techniques for accurately determining when the combined storage limits of the disks 130, 140, and 150 are approached and generating a report to alert a user....In simplified terms, the present invention determines the order in which the disks are filled, and knowing, for example, that if disk 140 is part full and that it was filled after disk 130, then adjusting the measure of fullness of disk 130 to 100%." Specification, page 5, line 1 – page 6, line 13. The techniques used by the present invention are techniques of monitoring not of reorganization. See, for example, "... Figs. 2A-2S, these figures show a process or module 200 for free space monitoring and report generation in accordance with the present invention." Specification, page 6, lines 22-23.

On the other hand, reorganization is recognized by Murray to be a rearrangement of data where "... rearrangement is known in the art as "reorganization."" Murray, col. 2, lines 12-17. Murray further states, "But, because reorganization moves data to reestablish physical groupings and data movement is time consumptive, the advantages of reestablished physical order come at a concomitant data base downtime price" Murray, col. 3, lines 18-24. This "concomitant data base downtime" for database reorganization is not what one would consider a monitoring operation on the database, because the database is "down" during the reorganization operation. Further, as a database increases in capacity, the effects of reorganization in terms of downtime also increase and consequently, Murray's reorganization technique would increasingly degrade system performance and not provide an appropriate noninvasive technique for monitoring a database.

Murray does not teach the claimed step of "adjusting the measure of storage space to full for the one or more storage volumes preceding the last storage volume" by using a counter during an unload process. In order for Murray to use the counter, the block must first be unloaded. Murray, col. 7, lines 48-55. The present invention does not require the use of an unload operation in order to determine the space used. Rather, by determining an order in which the multiple disk storage volumes are filled, thereby recognizing a last storage volume and one or more preceding storage volumes, the space used is adjusted for volumes preceding the last storage volume in a series of volumes because the preexisting OSAM software tool does not correctly set the used amount on the first volumes in a series. See Fig. 2I of the Specification, description block after decision block 237. The techniques of the present invention are

structurally different and operationally different than the techniques used by Murray. The present invention uses a monitoring technique for accurately determining database space and Murray uses a reorganization technique for rearranging a database through unloading, regrouping, and loading operations.

Koeppen also addresses reorganization. More particularly, Koeppen describes "...a method of reorganizing an IMS database." Koeppen's method consists of "...parallel unload processes to be used in unloading the database" and "...a plurality of parallel load processes". Koeppen, col. 2, lines 32-50. These unloading and loading processes are necessary operations in reorganizing a database, but are not required operations in the monitoring operation of the present invention. Further, Koeppen does not address the problem of reliably using tools, existing at the time of the application, for space determination for datasets guaranteed space, for example, when a data file spans multiple disk storage volumes. There is no recognition of this problem in Koeppen and, consequently, Koeppen provides no description of methods for resolving this problem that have been identified and addressed in an advantageous manner by the present invention.

Even assuming, *arguendo*, one could or would combine the data base reorganization system of Murray with the data base reorganization system of Koeppen, the result would be another data base reorganization system. This new data base reorganization system would inherit the limitations of Murray and Koeppen and would structurally remain a reorganization system. A reorganization system is not a monitoring system as presently claimed by the present invention.

This hypothetical new database reorganization system would not teach and would not make obvious the present invention as presently claimed.

Coy describes another database reorganization system and method that rearranges data based on spatial and temporal locality of usage of data files when moving data files within a storage hierarchy. Data files are moved within a storage hierarchy to optimize costs associated with archiving and retrieving related files on various cost storage devices. In Coy, the size of data files is one aspect of meta data collected on the files and may be approximated. See Coy col. 6, lines 19-23 and col. 8, lines 36-41 and lines 58-63. This use of approximate, estimated, and guessed at sizes and capacities indicates that an accurate knowledge of a data base size is not an important aspect of Coy's system. Consequently, it appears Coy does not recognize inaccuracies in data sizes obtained through standard tools and possibly does not care within certain limits. Additionally, the problems being addressed by Coy concern the movement of related data files within a storage hierarchy and the techniques of resolution of these problems are distinctly different from the claimed aspects of the methods and apparatus of the present invention. In any case, Coy does not perform the claimed steps and does not make those steps obvious.

Pastilha describes a system for moving software and its associated files from a system where the software is in operation to a new system where the software is to operate in the future. The system running the software is considered to be hosting the software and the process of moving the software to a new system is considered a rehosting of the software. Pastilha describes a system and methods for accomplishing such rehosting by use of a discovery tool that

assesses the software and computing environment. The discovery tool makes use of system facilities and tools in assessing the software and computing environment, including lists of files used by the software.

In the Official Action, statements are made concerning the subroutines SUBLISTC and IEHLISTR. An objection is taken to the suggestion by the Official Action that a SUBLISTC command is a command similar to LISTCAT and that IEHLISTR subroutine is similar to the IEHLIST utility. To be exact, SUBLISTC and IEHLISTR are subroutines of the present invention and not used in Pastilha, nor should they be confused with LISTCAT or IEHLIST. Pastilha does describe the creation of a JCL job that uses an IEHLIST utility to access space utilization information from the hosting system. See Pastilha col. 6 lines 28-40. The mere mention of the use of the utility IEHLIST and similarly the use of a control statement LISTCAT does not indicate a recognition of the problems addressed by the present invention. Pastilha addresses a very different set of problems than are addressed by the present invention. Pastilha indicates that its JCL job gathers information on data sets and a data set resides on a single volume. See Pastilha col. 6, lines 36-38. Thus, Pastilha does not describe any steps used to determine space utilization for datasets guaranteed space, for example, when a data file spans multiple disk storage volumes. The present invention includes a recognition by the inventor that the use of standard tools for determining space utilization, when a data file spans multiple disk storage volumes, can be unreliable.

Donovan describes a system and method for accounting for computer data storage utilization that uses standard utility software to determine data set size and a number of access

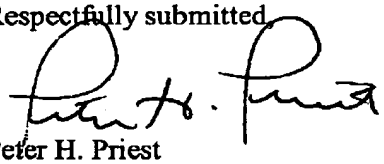
retrieval characteristics. See Donovan col. 3, lines 1-37. No mention of the unreliability of using standard tools for large data sets that span multiple disk storage volumes is made by Donovan. Consequently, it is clear that Donovan does not teach and does not make obvious the present claims.

By contrast, the present invention, among its several aspects, addresses both problems of reliability and accuracy of using standard tools for a database that span multiple disk storage volumes. See the disclosure of the present invention at page 1, lines 19-24, page 5, lines 5 through page 6, line 8 for example. To address such problems, software such as standard IMS OSAM software may be advantageously modified as taught by the present invention. One aspect of the present invention, addresses "monitoring the database during the storing of the plurality of data files to determine an order in which the multiple disk storage volumes are filled, the order determination comprising recognition of which of the multiple disk storage volumes is the last storage volume and recognition of one or more storage volumes preceding the last storage volume". Another aspect of the present invention, addresses "adjusting the measure of storage space utilized to full for the one or more storage volumes preceding the last storage volume". See the newly added claim 23 and page 2 lines 8-13, for example.

Conclusion

All of the presently pending claims, as amended, appearing to define over the applied references, withdrawal of the present rejection and prompt allowance are requested.

Respectfully submitted,



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